History of the Department of Physics at UWA

Issue No. 16: "Historic Plaques in the Physics Lecture Theatres"

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When the Lecture Theatres in the current Physics Building were being described in Issue 15, it was mentioned that plaques commemorating famous physicists were mounted on the side walls of these theatres. These were devised and commissioned by Professor C.J.B. Clews and no doubt he saw these as a modern counterpart of the stone bas-reliefs built into the front walls of the 1935 Physics/Chemistry building, as described in Issue 4.

Upper (Clews) Theatre, north wall

Lower (Ross) Theatre, north wall

There are four plaques on each of the side-walls of each of the Upper and Lower Theatres, making 16 in all. As four are repeated in the two theatres, these plaques commemorate 12 distinguished physicists and their contributions to science.

These plaques are reproduced on the following pages, together with descriptive text taken from an unsigned, typed document found amongst the author's files - a copy of which also resides in the UWA Archive File No. 2070. Photography of plaques: J.L. Robins.

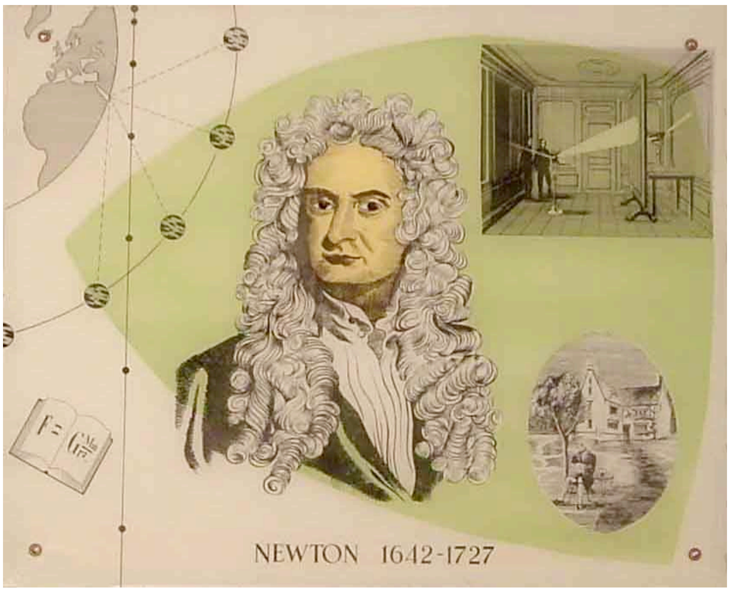
Lower Lecture Theatre, north wall.
Four plaques starting from the back (highest level).

Archimedes

Archimedes was born in the Greek city of Syracuse. Adjacent to the map locating Syracuse are shown contemporary coins from Syracuse.

The other features in the plaque illustrate his discovery of the fundamental principles of hydrostatics (according to tradition made in the bath), his discovery of the principle of the lever ("Give me where to stand and I shall move the earth"), and finally the Archimedean screw for raising water.

Newton

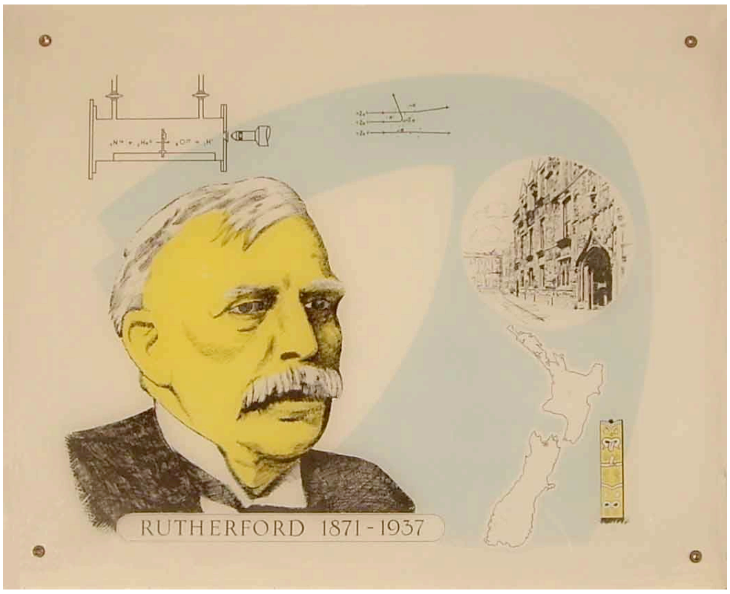


The manor house in Walthorpe (Lincolnshire) in which Newton was born is shown, and in the garden appears the traditional apple tree.

His theory of gravitation is indicated by the symbolic inscription of the law of gravitation, the earth-moon system and the path of a body falling freely under uniform gravity.

His work in optics is represented by his famous experiment showing the dispersion of sunlight by a prism.

Rutherford



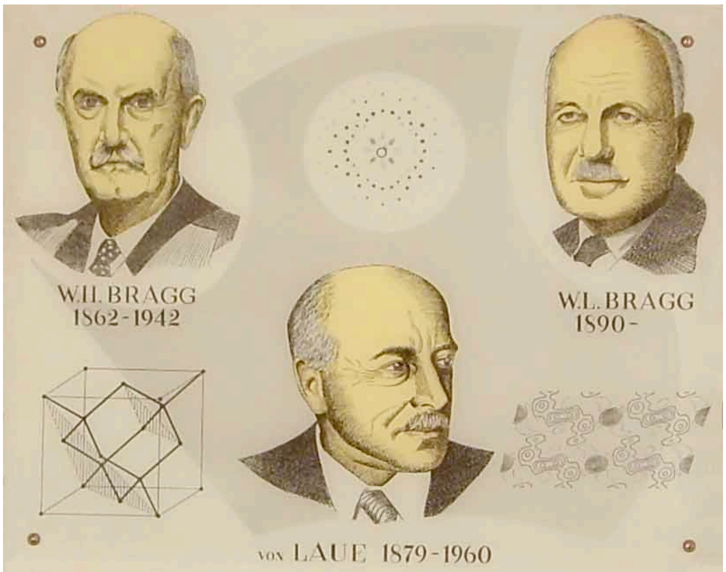
His native country, New Zealand, is depicted in the bottom right-hand corner, his birthplace (Nelson) being marked on the map.

The Cavendish Laboratory, where his most famous work was done is shown.

Rutherford observed and explained the first nuclear reaction - the artificial transmutation of nitrogen into oxygen. The reaction is shown within a diagram of the apparatus used.

The angular distribution of alpha particles scattered by metal foil led Rutherford to the nuclear theory of atomic structure - a small massive positively charged nucleus surrounded by orbital electrons. In the diagram are shown wide-angle scattering of an alpha particle by a nucleus and small angle scattering of alpha particles by orbital electrons.

W.H. Bragg. W.L. Bragg and von Laue



These three names are famous in the discovery and investigation, by means of X-rays, of solid state structure, in particular the structure of crystals.

von Laue first developed the technique. This is commemorated by a "Laue pattern" (as it is termed) of ammonium chloride (top centre).

Both Braggs (father and son) in 1913 determined the structure of diamond. The diagram on the left illustrates this structure.

The representation of a crystal as a Fourier series and the determination of the electron density distribution in a crystal are also associated with the names of both Braggs. The diagram on the right is the Fourier map showing the projected electron density distribution in the mineral diopsite, published in 1929.

Lower Lecture Theatre, south wall.
Four plaques starting from the back (highest level).

Galileo

Galileo was born in Pisa, Italy. The famous leaning tower is shown where Galileo was able to demonstrate what at the time was inexplicable and completely unexpected - that a heavy body falls to the earth at the same rate as a light body.

The view inside the cathedral shows the swinging lamp, observing which Galileo deduced that the period of a pendulum is independent of the amplitude of vibration.

Finally there is the telescope he invented. This revealed the moons of the planet Jupiter. The diagram which he drew to represent Jupiter and its moons, as he saw them, is shown.

Faraday

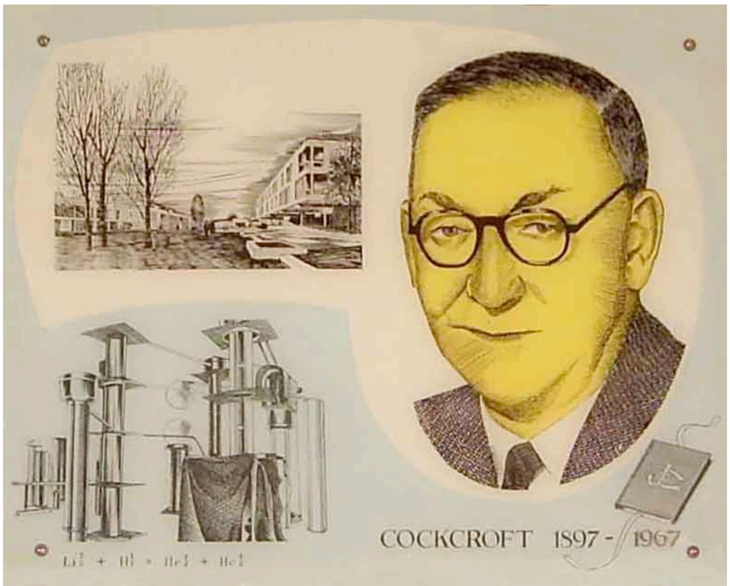
There is a view of Faraday's Laboratory at the Royal Institution.

The iron ring, wound with primary and secondary windings, is the one with which he discovered electromagnetic induction.

There appears also a vertical section of the apparatus with which he observed and measured the specific inductive capacity of insulators or dielectrics.

In his thinking about electric and magnetic fields Faraday used his conception of lines of force. Lines of force for two equal positive charges are shown.

Cockcroft

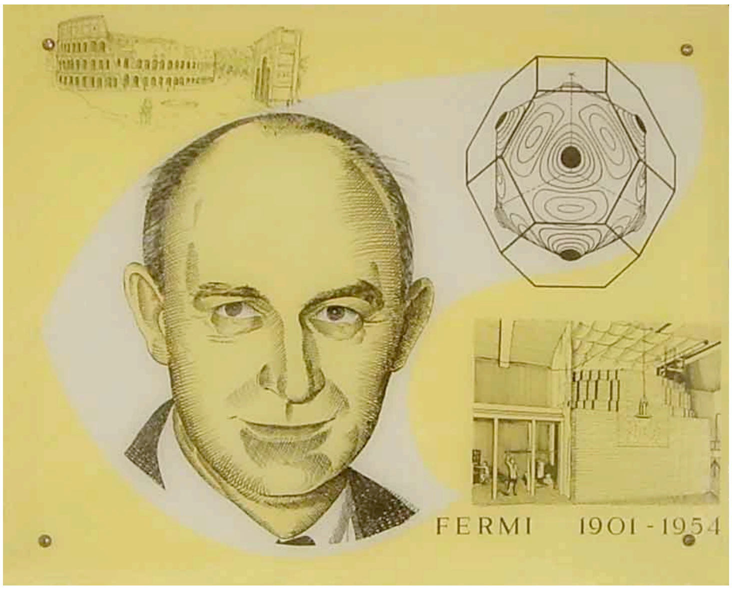


In 1932 J.D. (Sir John) Cockcroft, in association with E.T.S. Walton, observed the first nuclear transformation with artificially accelerated particles. The equipment is shown and also the equation describing the nuclear reaction: protons incident on lithium produce alpha particles (helium nuclei).

In 1962 Sir John became Master of Churchill College, Cambridge, a view of which is shown.

Those who knew Sir John were well acquainted with the "little black book".

Fermi



Fermi was born in Rome, typified by the Colosseum and the Arch of Constantine. In 1942 the first nuclear reactor was put into operation in Chicago under Fermi's lead. A view is shown.

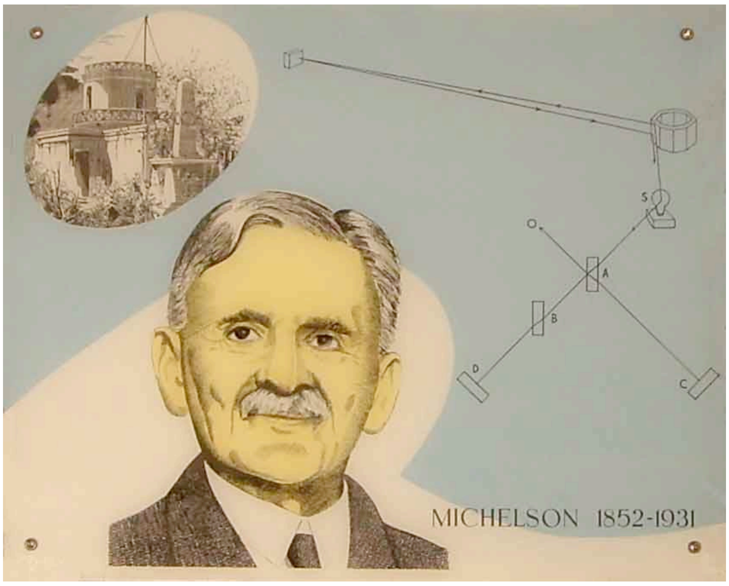
The geometrical surface shown here is the Fermi surface of copper. The "Fermi surface" is an abstract concept that represents graphically the momentum states of electrons in metals. The theory elucidates the many and varied electronic properties of metals.

Upper Lecture Theatre, north wall.
Four plaques starting from the back (highest level).

Archimedes: See Lower Lecture Theatre plaque descriptions.

Newton: See Lower Lecture Theatre plaque descriptions.

Michelson



The building is the Naval Academy at Annapolis from which Michelson graduated in 1873, and where he, two years later, became Instructor in Physics and Chemistry, a position which he occupied until 1879.

Michelson's name is associated with experiments involving refined optical techniques.

The principle of his famous interferometer is illustrated in the lower section of the diagram shown. This instrument was first used to investigate the relative motion of the earth and the luminiferous ether, and provided what turned out to be a fundamental experiment bearing on the nature of space and time.

Michelson's classical determination of the velocity of light is illustrated in the upper part of the diagram.

Bohr

Bohr was born in Copenhagen. Two conspicuous features of the city are the Town Hall Clock Tower and the statue of two Viking warriors blowing upon their lur.

He applied Planck's quantum theory to Rutherford's theory of the nuclear atom. This led to the first quantitative theory of atomic spectra. The mechanism of the emission of light by an atom according to the theory of Bohr, is illustrated in the case of the emission, by atomic hydrogen, of the Balmer series of spectral lines.

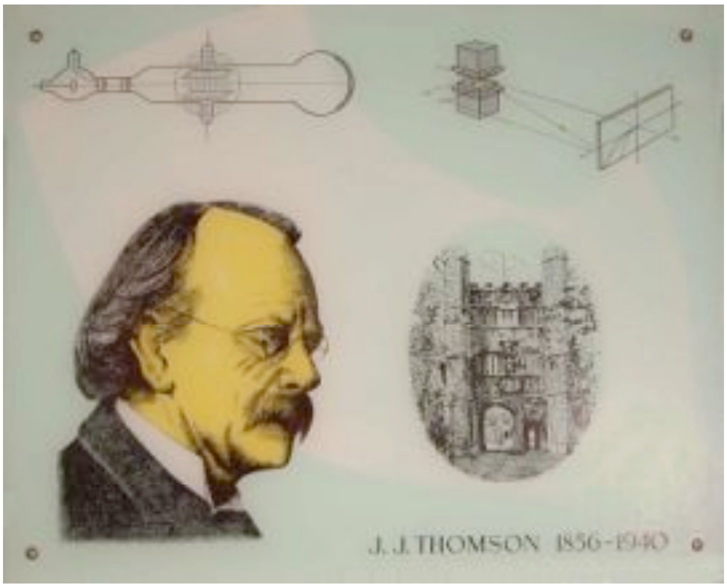
Bohr also developed the liquid drop model of the nucleus. When subsequently nuclear fission was discovered, it fitted harmoniously into the pattern of nuclear reactions envisaged by Bohr.

Upper Lecture Theatre, south wall.
Four plaques starting from the back (highest level).

Galileo See Lower Lecture Theatre plaque descriptions.

Faraday See Lower Lecture Theatre plaque descriptions.

J.J. Thomson



Thomson, the discoverer of the electron, was Master of Trinity College, Cambridge, for the last 22 years of his long life. Trinity Gateway is the architectural feature depicted.

In the top left-hand corner is shown the design of the equipment with which the discovery of the electron was made. This established the corpuscular nature of electricity.

The other diagram illustrates principles employed by Thomson in showing for the first time that atoms have discrete masses, or at least discrete values of the ratio charge : mass.

Einstein

Einstein was born in Ulm (Würtemberg, Germany). A characteristic scene in the city is depicted.

The special theory of relativity is suggested in the famous mass-energy equation. This equation combines in one broad generalisation the two previously unrelated principles of the conservation of mass and the conservation of energy.

The general theory of relativity is indicated by a representation of a total solar eclipse. It is during such an event that a test of one of the deductions from the general theory can be made - the deflection of light by a gravitational field.

Einstein was an accomplished violinist.